

# **QUALITY MEDICAL REPORTING FOR WORKERS' COMP**

## **OBJECTIVES – WORKERS’ COMPENSATION REPORT**

1. Describe the information that should be included in any complete narrative report for an impairment rating.
2. Define “medically probable.”
3. Describe the mechanism by which a physician determines an injured worker’s job responsibilities before returning him/her to work.
4. Identify the four items that must be included on the maximum medical improvement report.
5. Explain the accepted manner of reporting impairment on a condition that is multifactorial and requires apportionment.
6. Identify parties who should not influence your medical decision regarding a case.

# **Elements of a Quality Workers' Compensation Medical Report**

## **Introduction**

Physicians perform three special functions in workers' compensation which are rarely required in general medical cases. The first is providing an opinion on the causal relationship between the work-related exposure or injury, and the patient's current pathology and need for treatment. Once causation has been established medical reports follow the traditional format of history including job requirements, physical examination, diagnosis and treatment. The second function occurs when a case is closed in workers' compensation and the physician must determine the presence or absence of a permanent impairment. If permanent impairment is present, then it must be rated according to the AMA Guides to the Evaluation of Permanent Impairment, Third Revised Edition. The rating must include the work sheets required by the Division of Workers' Compensation, and conform to the Level II curriculum and applicable Rule 12 impairment rating requirements.

Finally a physician must be able to communicate to non-medical personnel information needed to resolve claim issues. For instance, employers and patients must be able to understand work restrictions, and insurance adjusters and lawyers must easily comprehend the origin of impairment ratings. While certain areas overlap between medical and legal concerns in workers' compensation, this does not override the ethical responsibility of the physician to protect the doctor-patient privilege. In this section, we will explore how to determine causation in workers' compensation, and review the elements required for a workers' compensation impairment rating report.

## **Risk-Assessment or Causal Relationships in Everyday Life**

Every day we make decisions based on an assessment of risk. We decide whether or not to fasten our seat belt on the way to work. We insist that our children wear bike helmets when riding in the neighborhood. When participating in recreational activities such as skiing or riding horseback, we decide whether or not to wear a helmet. These activities all have a different level of risk. Our decision to wear protective equipment is usually based on the personal inconvenience of wearing the equipment, weighed against the actual risks of a catastrophic event.

## Causality Assessment in Medicine

Practitioners assess causality and risk when treating any medical case. The patient's reported history, combined with the physical exam findings, determine the likelihood of a specific disease, thus dictating diagnostic procedures and treatment. For example: a 55 year old overweight, hypertensive male presenting with low back pain must be assessed for abdominal aneurysm, whereas a 25 year old female with low back pain has little likelihood of abdominal aneurysm but should be assessed for an ectopic pregnancy. Using knowledge of common causes for back pain to establish differential diagnoses is actually assessing the risk of a particular diagnosis.

## Workers' Compensation Causality

In worker's compensation the health care provider must discuss the relationship between the patient's diagnosis and the work-related exposure. The assessment process requires estimating the risk of developing the suspected diagnosis as a result of the actual exposure of the individual patient. Legally the physician must be able to state the medical probability, greater than 50% likelihood, that the patient's diagnosis and physical findings are related to the work-related exposure.

## Causation Assessment

1. Record an occupational medical history including a detailed description of the incident reportedly causing the injury or a complete job description of all activities which could have contributed to the patient's symptoms. The description of job duties should include a list of physical activities required, the duration and frequency of these activities and the total time the individual has worked in the job position. At a minimum, the job activities description should consider specific hand tool use, driving or other skilled activities, approximate lifting estimations, description of the posture required in order to complete the job tasks and consideration of the force necessary for the job tasks.
2. Take a complete medical history including medical diseases past and present, and non-occupational activities which could have affected the complaint. Record hobbies involving the hands for upper extremity complaints and weekend sports activities for musculoskeletal injuries.
3. Establish a differential diagnosis for the patient using the complete history, physical exam findings, and the results of any preliminary diagnostic testing.
4. Assess the medical probability of the relationship between the assumed diagnosis and the work-related exposure.

## Case Examples

In many cases the relationship between exposure and disease or injury is extremely clear. For instance, the patient with a mesothelioma who worked in the shipping industry in World War II and was exposed to asbestos has a medically probable relationship between his disease and World War II employment. A worker who slips on the ice entering the work-site and then complains of knee pain may be a more difficult case. In order to establish work-relatedness, the mechanism of the fall should be consistent with the suspected knee joint pathology. Among the most difficult causality questions are those related to cumulative trauma or repetitive motion. All cases should be determined using risk assessment techniques. The physician should examine existing scientific evidence to determine whether the individual's work exposure is the proximate cause of the disease process or injury. The Division has established risk factors for upper extremity injuries involving cumulative trauma and Carpal Tunnel Syndrome; those may be found in the Division's CTD and Carpal Tunnel Syndrome Medical Treatment Guidelines.<sup>1</sup>

## Risk Assessment Method – Modified Bradford-Hill

1. Strength of the association: The study should show a significant relative risk for developing the disease in question when populations are exposed at a specific exposure level.
2. Consistency of the evidence: Studies with different populations exposed to similar work exposures should produce the same result.
3. Specificity of the result: Studies should be sufficiently controlled to prove that the exposure was the cause of the diagnosis, rather than other confounding exposures or disease entities.
4. Temporal Relationship: The timing of the study and follow-up investigation of the workers should be sufficient to identify the disease in question. Long latency disease studies should exclude those cases occurring too early to be related to the exposure identified in the study.
5. Biological gradient: Studies should show that the greater the exposure, the greater the likelihood of a particular disease or injury. In some cases the phenomenon is "all or none" and no gradient will be present.
6. Coherence: The proposed exposure should be biologically plausible and consistent with previous research. Naturally when an entirely new causal relationship is discovered, initial reports will not necessarily conform to previous

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<sup>1</sup> See pages at the end of this section from the treatment guidelines. For non-upper extremity injuries, see the attached table from NIOSH review.

literature on the subject.

## **Workers' Compensation Statutes**

Work related exposure must be the “proximate cause” of the disease or injury.

Proximate cause is defined in Black's Law Dictionary as the last act “contributory to an injury, without which such injury would not have resulted. The dominant, moving or producing cause.”

## **Pre-Existing Medical Condition**

A pre-existing medical condition, which may pre-dispose the worker to an injury, does not necessarily mean the case is not work-related. If the worker would not have the injury **without** the work-related event, the injury is most likely also work-related.

The physician should not confuse the presence of pre-existing disease with the concept of proximate cause. A patient with a pre-existing medical meniscus tear may slip on a wet floor at work and further injure the meniscus. The injury would be work-related, even though the pre-existing condition resulted in an injury that is greater than might have occurred in a worker with a normal knee. However it is appropriate for the physician to discuss the impact of the pre-existing diseases or other concurrent disease or injury processes on the patient's work-related condition.

## **Using Risk Assessment**

Case example – A worker is exposed to very low level formaldehyde on a weekly basis.

Consider the following two scenarios:

1. The worker claims to have irritant-induced reactive airway disease.
2. The worker claims the formaldehyde aggravated his pre-existing asthma.

When making a causality determination the health care provider should utilize the risk assessment method to define the limit at which the exposure in question would be a medically probable cause of the disease or injury in question. For instance, exposure to low levels of formaldehyde is not likely to cause irritant pulmonary symptoms and is extremely unlikely to cause permanent reactive airway disease. Thus a patient who has been exposed only to low levels of formaldehyde cannot claim that their reactive, irritant-induced airway disease is due to formaldehyde exposure, as no medically probable relationship exists between the formaldehyde exposures and the disease. On the other hand, even at low

exposure levels, the patient could develop an allergy to formaldehyde, which exacerbates his pre-existing asthma

***Always answer this question: “Without the work-related exposure or accident, is it medically probable that the patient would have the current diagnosis and require treatment?”***

## **Activities of Daily Living**

Generally, if a worker is performing an activity he would normally be expected to perform in day-to-day tasks at home the injury will not be work-related.

Case – An executive suffers a heart attack while reviewing his routine, office e-mail.  
This would not be work-related.

## **Isolated Mental Impairment (no physical injury)**

Pursuant to C.R.S. §8-41-301(2)(a), mental impairment:

“ . . . means a recognized, permanent disability arising from an accidental injury arising out of and in the course of employment when the accidental injury involves no physical injury and consists of a psychologically traumatic event that is generally outside of a workers’ usual experience and would evoke significant symptoms of distress in a worker in similar circumstances. A mental impairment shall not be considered to arise out of and in the course of employment if it results from a disciplinary action, work evaluation, job transfer, layoff, demotion, promotion, termination, retirement, or similar action taken in good faith by the employer.”

The final determination of work-relatedness rests with the judicial system, not the medical system. This allows consideration of course and scope of duties, enforced safety standards, and location of injury.

**Remember: Your medical diagnosis and causality discussion is essential to a work-related case**

## CAUSALITY CHART

<i>STEPS IN CAUSALITY DETERMINATION</i>	
1.	<b>Establish diagnosis (or differential diagnosis if further testing required)</b>
2.	<p>Define Injury or Exposure</p> <p>For Exposures include</p> <ul style="list-style-type: none"> <li>❖ Length of exposure</li> <li>❖ Level of exposure (actual lifting required, amount of repetitive motion, special tool use, etc.)</li> <li>❖ Comparison of worker's exposure to that of the normal population</li> </ul>
3.	<p>Discuss Intervening Factors</p> <p>Concurrent non-work-related injuries or disease processes, pre-existing impairment, or disease related activities outside of work, sports, hobbies, etc.</p>
4.	<b>Explain any scientific evidence supporting a cause and effect relationship between the diagnosis and the exposure or injury</b>
5.	<p>Assign a medical probability level to the case in question</p> <ul style="list-style-type: none"> <li>❖ Medically probable &gt;50% likely</li> <li>❖ Medically possible ≤ 50% likely</li> </ul>

### Summary of NIOSH Reviews\*

Table 1. Evidence for casual relationship between physical work factors and MSDs

Body part <i>Risk factor</i>	Strong Evidence (+++)	Evidence (++)	Insufficient Evidence (+/0)	Evidence of No effect (-)
<b>Neck and Neck/Shoulder</b>				
<i>Repetition</i> _____		X		
<i>Force</i> _____		X		
<i>Posture</i> _____	X			
<i>Vibration</i> _____			X	
<b>Shoulder</b>				
<i>Posture</i> _____		X		
<i>Force</i> _____			X	
<i>Repetition</i> _____		X		
<i>Vibration</i> _____			X	
<b>Elbow</b>				
<i>Repetition</i> _____			X	
<i>Force</i> _____		X		
<i>Posture</i> _____			X	
<i>Combination</i> _____	X			
<b>Hand/wrist</b>				
Carpal tunnel syndrome				
<i>Repetition</i> _____		X		
<i>Force</i> _____		X		
<i>Posture</i> _____			X	
<i>Vibration</i> _____		X		
<i>Combination</i> _____	X			
Tendinitis				
<i>Repetition</i> _____		X		
<i>Force</i> _____		X		
<i>Posture</i> _____		X		
<i>Combination</i> _____	X			
Hand-arm vibration syndrome				
<i>Vibration</i> _____	X			
<b>Back</b>				
<i>Lifting/forceful movement</i> _____	X			
<i>Awkward posture</i> _____		X		
<i>Heavy physical work</i> _____		X		
<i>Whole body vibration</i> _____	X			
<i>Static work posture</i> _____			X	

\*Musculoskeletal Disorders And Workplace Factors A Critical Review of Epidemiologic Evidence for Work-Related Musculoskeletal Disorders of the Neck, Upper Extremity, and Low Back Edited by: Bruce P. Bernard, M.D., M.P.H.; U.S. Department Of Health And Human Services; Public Health Service Centers for Disease Control and Prevention National Institute for Occupational Safety and Health, July 1997

## **Creating a Narrative Impairment Report**

The first goal of writing an impairment report is to assure adequate communication of the issues to all parties. Remember your impairment report will be used in a medical/legal context. The impairment rating is the basis for paying permanent partial disability. All parties should understand the origin of your impairment rating, and how it reflects the functional impairment of the patient. In addition, your report must address other legal issues such as the need for continuing care and any permanent work restrictions. The following sections should be included in an impairment rating report.

### **History**

An impairment rating report should include a description of the mechanism of injury, or work-related disease and exposure. Be sure to address all areas of the body or organ systems that have been treated under the claim. Pertinent diagnostic tests should be noted when they were essential to establishing the pathological basis of disease or injury. A short summary of the treatment specifically including any surgical procedures should also be included.

It is essential to describe the patient's functional ability to perform activities of daily living (ADLs). Activities of daily living refer to self-care and personal hygiene, communication, normal living postures, ambulation, travel, nonspecific hand activities, sexual function, sleep, and social and recreational activities. ADLs are the basis for impairment rating, and should be used as a guide for determining the proper percentage when physicians must choose within a range of values to establish the impairment rating. The current occupation and work level of the patient should also be noted.

Finally, a list of the medical records reviewed for the report should be provided to the reader if a non-treating physician does the impairment rating. Otherwise parties will not know whether you reviewed specific material or did not receive the material.

### **Physical Examination**

Remember to examine all pertinent body parts treated under this claim. Record specific range of motion values for any joints or spinal areas that are to receive an impairment rating. Neurological findings should also be recorded in detail to demonstrate to the basis for your rating. In addition it is important to include notations on trigger points and muscle spasm. If findings are inconsistent, they should be recorded as such.

## **Work Restrictions**

Many patients who are receiving permanent partial impairment will have a work restriction. It is important to provide the specific physical details of the work restriction. Describe any permanent work restrictions including limitations for hours of work as well as physical limitations.

## **Maximum Medical Improvement**

Be sure to establish that maximum medical improvement, the time at which the impairment “has become stable and no further treatment is reasonably expected to improve the condition,” is present for all areas under treatment. An impairment rating should not be rendered until all areas are at maximum medical improvement, including mental impairment where appropriate. At times a patient may refuse to undergo the treatment that has been recommended by their physicians. In this case physicians must rate the individual as they are at the time of maximum medical improvement. Physicians cannot rate based upon possible changes to the patient’s condition over time or as if the treatment that was recommended had actually been undertaken. It is also appropriate to declare the patient at MMI if further treatment would improve the patient’s condition, but the patient refuses to undergo any of the treatment that might be expected to improve their condition.

## **Continuing Treatment**

Treatment can continue to occur after maximum medical improvement if it is needed to sustain the patient’s functional status. It is also important to note that a patient may settle a claim as full and final and be paid for future medicals in the settlement. In this case there will no further money provided by the insurer for continuing medical treatment. All parties should have a detailed understanding of the continuing treatment you expect may be necessary due to the injury or disease. This would include noting such conditions as severe degenerative knee disease, which may require a joint replacement in the future. It is essential that the patient and the insurance company understand the future medical liability for the life of the patient.

## Impairment Rating

Be sure to address all of the diagnoses that you identified in your report as related to the workers' compensation injury. Some of these may not have an associated impairment rating, but it should be clearly addressed in your report. Finally, include all required worksheets from the AMA Guides or the Division. The following are required forms depending on the body parts involved: the spinal range of motion and summary forms, the upper extremity forms, the lower extremity form and the psychiatric form. Ratings will be returned to you if they do not contain the appropriate worksheets.

You should report the impairment rating as a whole person rating in concordance with the AMA Guides. All of the extremity worksheets must be provided because in many cases the patient will be paid permanent impairment as a "scheduled injury". A list of scheduled injuries is set forth in the Workers' Compensation Act. For scheduled injuries the permanent partial disability payment is calculated based on the level of the injury. For instance, a hand injury is paid using the hand impairment percentage and multiplying it times the available dollars in the statute for injuries to the hand. Scheduled injuries are paid at a much lower rate than whole person injuries.

Be sure to double-check your impairment rating to see that you have completed all the worksheets, and that the final rating has combined all of the relevant impairment values. The AMA Guides uses a method called *combination* to arrive at the final whole person or extremity rating. This is required because an arm is equal to 60% of the whole person, and a leg is 40% of the whole person. Thus if all four extremities were lost and the impairments were additive, the result would be a 200% loss of whole person. Since we cannot exceed a 100% loss, there must be an algebraic method for combining numbers to avoid exceeding 100%. This is achieved using the combined values chart on pages 254-56 of the Guides. This chart is generally used in any case in which unlike impairment ratings must be combined. Thus, an impairment rating for radicular problems in the leg, and an impairment rating for a spinal fracture are discordant impairment ratings and would be combined to arrive at the full value.

You should pay attention to those areas which are added and not combined. The most common of these is the addition of all ranges of motion at the same joint. Also the total impairment ratings for each digit are added to establish a hand impairment value. Be sure to combine only the ratings at the same anatomic level and in the same extremity, when applicable. Thus an upper extremity rating at the shoulder can only be combined with a hand rating after the hand rating is converted to an upper extremity rating. Once the combination of terms has been completed, remember to advance the rating to a whole person level.

When describing your impairment rating, be sure to reference the exact tables used, unless that is already noted on the worksheet. If the impairment rating differs from that of another physician on the same case, you should include a discussion of the differences and why you have chosen the particular rating method you are using.

It is essential to not confuse an impairment rating with disability. In some cases, a person may actually be unable to return to work and have almost no impairment. In other cases a patient may be able to return to work and yet still receive impairment. Consider a pianist who loses her index finger. She is totally disabled from her chosen profession and must be retrained; however her impairment rating would be limited to 100% of the index finger or 11% whole person. An internist with the same index finger loss will receive the same impairment rating, since it is based on activities of daily living. In contrast, the internist will have no change in her ability to continue her occupation and earn the same salary. It is important not to equate these two concepts. If any ADLs are functionally affected due to an established work-related injury or disease, the physician should use the Guides to determine the level of impairment.

### **Impairment Rating for Workers who have Undergone an Invasive Treatment Procedure**

The rating physician should keep in mind the AMA Guides, 3<sup>rd</sup> Edition (rev.) definition for impairment. “The loss of, loss of use of, or derangement of any body part, system, or function.” Given this definition, one may reasonably assume any patient who has undergone an invasive procedure which has permanently changed any body part has suffered a derangement under the definition of impairment according to the AMA Guides, 3<sup>rd</sup> Edition (rev.). Therefore it is incumbent on the rating physician to perform the necessary testing as appropriate in that edition of the Guides for the condition which was treated by the invasive procedure. This should not be interpreted to say that all persons with invasive procedures necessarily qualify for an impairment rating. The impairment rating on many individuals who have had invasive procedures may be zero percent. Thus in cases with surgical procedures the person qualifies under the initial definition of impairment due to the derangement of a body part or system and the rating physician must justify the zero percent rating using the appropriate portions of the AMA Guides, 3<sup>rd</sup> Edition (rev.). Examples in which this rating procedure is necessary include arthroscopic debridement of the shoulder, anterior cruciate ligament surgery of the knee, facet rhizotomy procedures, and surgery to repair carpal bone instability.

### **Preexisting Impairment**

An impairment rating may be apportioned when the patient qualified for an impairment rating using the Third Revised Edition of the Guides prior to the current workers’ compensation injury or disease, and with consideration of any other applicable statutory requirements (see next paragraph).. In this case the physician must create a pre-injury rating using the AMA Guides, Rule 12 and Level II curriculum. This rating must be established on verifiable facts.

If a patient qualifies for a pre-injury rating from Table 53 – Impairments due to Specific Disorders of the Spine – then range of motion may be apportioned. Range of motion can be apportioned using pre-injury range of motion measurements on the patient, or if there are no pre-injury range of motion measurements, an apportionment can be accomplished using the spinal apportionment worksheet found in the spinal portion of the curriculum. Once a pre-injury apportionment rating is established, it should be subtracted as appropriate from the

current total impairment rating.

In 2008 the law regarding apportionment of preexisting conditions changed for cases with a date of injury on or after July 1, 2008. In those cases, where the *prior* injury was *non-work-related*, apportionment may only apply if that prior injury was identified, treated, and independently disabling at the time of the current work-related injury. See the Apportionment of Impairment “flow chart” at the end of this section for details.

**Guide to Writing a Narrative Impairment Report:** The following is a succinct guide to the elements you should include in an impairment report.

- Thorough review of records, with quotations as appropriate.
- Documentation of patient’s complaints.
- Summary of the clinical course.
- Thorough description of physical examination findings and psychometric testing results.
- Diagnostic impressions.
- Causation as appropriate, with rationale.
- Status of medical stability/MMI.
- Impairment Rating with rationale.
- Apportionment as appropriate, with rationale.
- Detailed description of work restrictions and work status.
- Limitations secondary to gaps in records, conflicting information, patient behavior, etc.
- Send the report to the appropriate parties.
- Say all that you can, but no more.

### **Causality and Report References**

The Independent Medical Evaluation Report, C.R. Brigham, S. Babitsky, J.J. Mangraviti, Jr., Seak, Inc., Falmouth, MA, 1996

“The Environment and Disease: Association or Causation?” A. Bradford Hill, Proceedings of the Royal Society of Medicine 58:295-300 1965

Table 1: Physical Examination Findings Reference Table (from CTD Treatment Guideline)

DIAGNOSIS	SYMPTOMS	SIGNS
DeQuervain's Tenosynovitis	Pain and swelling in the anatomical snuffbox; pain radiating into the hand and forearm; pain worsened by thumb abduction and/or extension.	Pain worsened by active thumb abduction and/or extension; crepitus along the radial forearm; positive Finkelstein's.
Extensor Tendinous Disorders	Pain localized to the affected tendon(s); pain worsened by active and/or resisted wrist or finger extension.	Swelling along the dorsal aspects of the hand/wrist/ forearm, and pain with active and/or resisted wrist/ digit extension, or creaking/crepitus with wrist extension.
Flexor Tendinous Disorders	Pain localized to the affected tendons; pain in the affected tendons associated with wrist flexion and ulnar deviation, especially against resistance.	Pain with wrist/digit flexion and ulnar deviation, or crepitus with active motion of the flexor tendons.
Lateral Epicondylitis	Lateral elbow pain exacerbated by repetitive wrist motions; pain emanating from the lateral aspect of the elbow.	Pain localized to lateral epicondyle with resisted wrist extension and/or resisted supination.
Medial Epicondylitis	Pain emanating from the medial elbow; mild grip weakness; medial elbow pain exacerbated by repetitive wrist motions.	Pain localized to the medial epicondyle with resisted wrist flexion and resisted pronation.
Cubital tunnel syndrome	Activity-related pain/paresthesias involving the 4 <sup>th</sup> and 5 <sup>th</sup> fingers coupled with pain in the medial aspect of the elbow; pain/paresthesias worse at night; decreased sensation of the 5th finger and ulnar half of the ring finger (including dorsum 5th finger); progressive inability to separate fingers; loss of power grip and dexterity; atrophy/weakness of the ulnar intrinsic hand muscles (late sign).	Diminished sensation of the fifth and ulnar half of the ring fingers; elbow flexion/ulnar compression test; Tinel's sign between olecranon process and medial epicondyle; Later stages manifested by intrinsic atrophy and ulnar innervated intrinsic weakness. Specific physical signs include clawing of the ulnar 2 digits (Benediction posture), ulnar drift of the 5 <sup>th</sup> finger (Wartenberg's sign), or flexion at the thumb IP joint during pinch (Froment's sign).
Hand-Arm Vibration Syndrome	Pain/paresthesias in the digits; blanching of the digits; cold intolerance; tenderness/swelling of the digits/hand/forearm; muscle weakness of the hand; joint pains in hand/wrist/elbow/neck/shoulders; trophic skin changes and cyanotic color in hand/digits.	Sensory deficits in the digits/hand; blanching of digits; swelling of the digits/hand/forearm; muscle weakness of the hand; arthropathy at the hand/wrist/elbow; trophic skin changes and cyanotic color in hand/digits.
Guyon Canal (Tunnel) Syndrome	Numbness/tingling in ulnar nerve distribution distal to wrist.	Positive Tinel's at hook of hamate. Numbness or paresthesias of the palmar surface of the ring and small fingers. Later stages may affect ulnar innervated intrinsic muscle strength.

*(Table Continued on next page)*

Pronator Syndrome	Pain/numbness/tingling in median nerve distribution distal to elbow.	Tingling in median nerve distribution on resisted pronation with elbow flexed at 90°. Tenderness or Tinel's at the proximal edge of the pronator teres muscle over the median nerve.
Radial Tunnel Syndrome	Numbness/tingling or pain in the lateral posterior forearm.	Tenderness over the radial nerve near the proximal edge of the supinator muscle. Rarely, paresthesias in the radial nerve distribution or weakness of thumb or finger extension.

**(From CTD Treatment Guideline)**

**4. Risk Factors**

A critical review of epidemiologic literature identifies a number of physical exposures associated with CTDs. Physical exposures considered risk factors include: repetition, force, vibration, pinching and gripping, and cold environment. When workers are exposed to several risk factors simultaneously, there is an increased likelihood of a CTD. Not all risk factors have been extensively studied. Exposure to cold environment, for example, was not examined independently; however, there is good evidence that, combined with other risk factors, cold environment increases the likelihood of a CTD. The table at the end of this section entitled, "Risk Factors Associated CTDs," summarizes the results of currently available literature.

No single epidemiologic study will fulfill all criteria for causality. The clinician must recognize that currently available epidemiologic data is based on population results, and that individual variability lies outside the scope of these studies. Many published studies are limited in design and methodology, and, thus, preclude conclusive results. Most studies' limitations tend to attenuate, rather than inflate, associations between workplace exposures and CTDs.

Many specific disorders, such as ulnar neuropathy (at the elbow and wrist) and pronator teres syndrome, have not been studied sufficiently to formulate evidence statements regarding causality. Based on the present understanding of mechanism of injury and utilizing the rationale of analogy, it is generally accepted that these disorders are similar to other CTDs at the elbow and wrist and are susceptible to the same risk factors. No studies examined the relationship between the development of ganglion cysts and work activities; however, work activities may aggravate existing ganglion cysts. It is generally accepted that keyboarding less than four hours per day is unlikely to be associated with a CTD when no other risk factors are present. It remains unclear how computer mouse use affects CTDs. The posture involved in mouse use should always be evaluated when assessing risk factors.

Studies measured posture, repetition and force in variable manners. In general, jobs that require less than 50% of maximum voluntary contractile strength for the individual are not considered "high force." Likewise, jobs with wrist postures less than or equal to 25° flexion or extension, or ulnar deviation less than or equal to 10° are not likely to cause posture problems.

These guidelines are based on current epidemiologic knowledge. As with any scientific work, the guidelines are expected to change with advancing knowledge. The clinician should remain flexible and consider new information revealed in future studies.

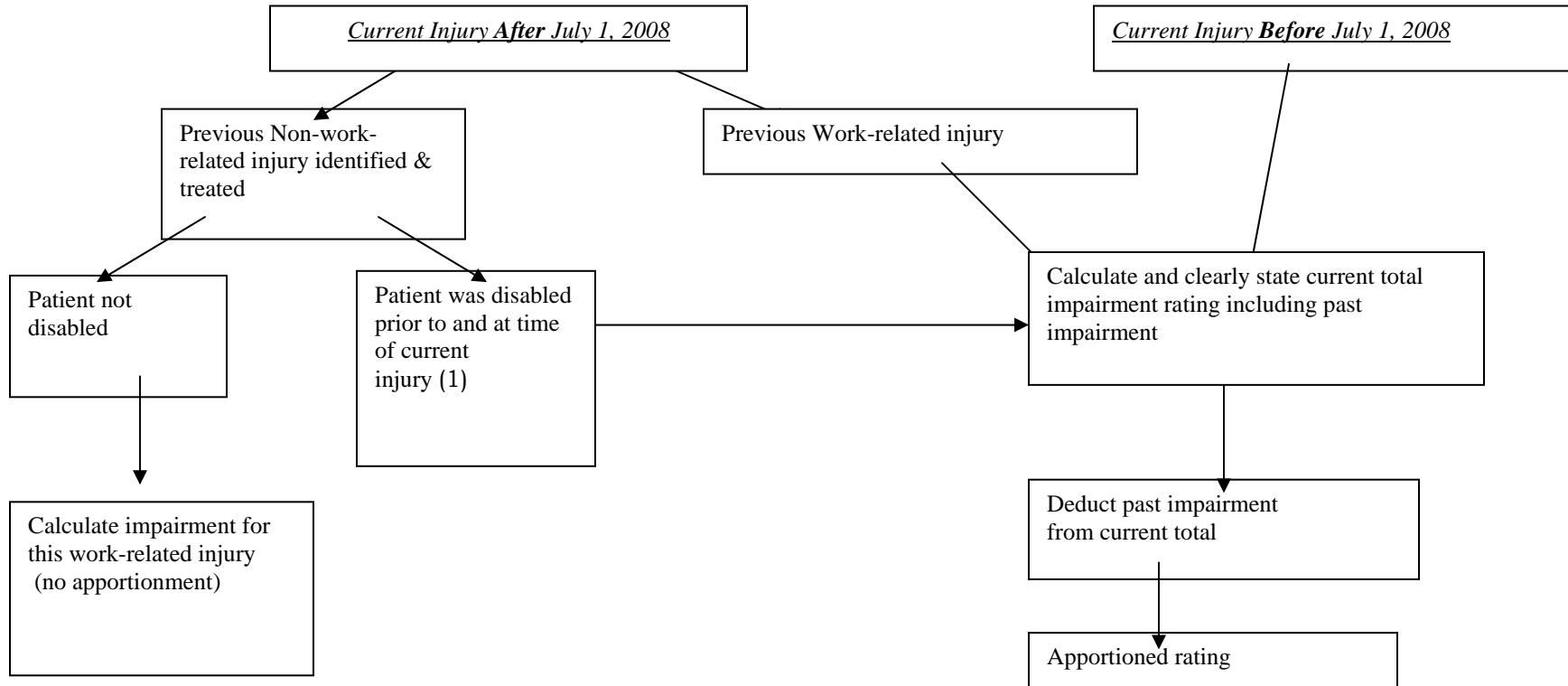
Table 2: Risk Factors Associated with Cumulative Trauma (from CTD Treatment Guideline)

Diagnosis	Strong evidence	Good evidence	Some evidence	Insufficient or conflicting evidence
Elbow Musculoskeletal Disorders (Epicondylitis)	Combination high force and high repetition (Exposures were based on EMG data, observation or video analysis of job tasks, or categorization by job title. Observed movements include repeated extension, flexion, pronation and supination. Repetition work cycles <30 sec or >50% of cycle time performing same task, and number of items assembled in one hour).	High force alone.		Repetition alone, extreme wrist posture.
Wrist Tendonitis, including DeQuervain's Tenosynovitis	Combination of risk factors: High repetition, forceful hand/wrist exertions, extreme wrist postures (Assessed by direct observation, EMG, and video analysis. One study measured time spent in deviated wrist posture).	Repetition, (as previously defined), not including keyboarding or force independently.	Posture	
Trigger Finger			Forceful grip (Holding tools, knives. Assessed by direct observation and video analysis).	



**APPORTIONMENT OF IMPAIRMENT**  
**Guideline for Accredited Physicians**  
**Changes per Senate Bill 08-241 and Workers' Compensation Rule 12-3**

**MEDICAL RECORDS OR OTHER OBJECTIVE EVIDENCE SUBSTANTIATES PRE-EXISTING IMPAIRMENT**



(1) 'Disabled' requires information that the prior injury was identified, treated, and independently disabling at the time of the current injury. 'Disability' is expected to include conditions which adversely impact the claimant's ability to perform his job, or limits the claimant's access to other jobs. Permanent work restrictions would generally fall in this category.

